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28 February 1957

CMCC Doc. No. 151X5.444

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Dear Dick:

We are forwarding herewith eight copies of Monthly Progress Letter No. 19, covering the work performed on System No. 3 during the period extending from 4 January 1957 to 4 February 1957.

Sincerely,

Burt

Burt

Enclosures:

CMCC Doc. No. 163X5.30

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Monthly Progress Letter No. 19

Contract No. A-101

System 3

4 January 1957 to 4 February 1957

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1. General

During the interval covered by this progress letter, the major effort was directed toward modifying the circuits of the airborne receiving set to obtain improved performance. Certain of these modifications have been incorporated in systems currently in production and the eighth system, including these modifications will be delivered on 7 February 1957. In addition, field-modification kits are being assembled so that systems in the field may be modified correspondingly. The System improvements achieved by these modifications are described below.

2. System Improvements

Modifications of the airborne receiving set were required as a result of tests performed on initial production units. These improvements have been incorporated in receiving sets currently in production and consist of the following:

- (1) In some instances, tests indicated that the 20-kc bias signal in the airborne recorder interfered with the operation of the lock-on circuits of the receiving set. This interference was eliminated by the addition of a 20-kc rejection filter in the output line of each receiver.
- (2) Transients generated by lock-on interfered with the operation of the third local-oscillator sweep circuit. This was corrected by an adjustment of the bias voltage in the reference-frequency converter circuit of the third local-oscillator assembly.
- (3) The marker pulse, which is used as a reference pulse in determining frequency, was modified in waveform to provide more reliable operation of the data-reduction equipment associated with System 3. This modification required a minor change in the marker-generator circuit of the third local-oscillator assembly.

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(4) The sweep-control circuit sometimes lost control momentarily if lock-on occurred at the end of a sweep interval. This was corrected by the redesign of one of the encapsulated subassemblies of the third local-oscillator assembly.

(5) Spurious responses were reduced by incorporating several modifications: The interaction of the first local oscillators of bands four and five was eliminated by the addition of a tuned trap in the r-f distribution line. A spurious oscillation arising from a parasitic overtone in the first local oscillator of band two was corrected by readjusting circuit components in the r-f amplifier of this band. Increased r-f bypassing in the heater circuit of the preamplifier assembly reduced some spurious responses. Higher harmonics of the reference-frequency oscillator in the third local-oscillator assembly appeared on the r-f distribution line and were suppressed by the addition of shielding.

(6) Other minor adjustments in circuit components to obtain improved performance were made.

3. In-Plant Modifications

In connection with the spurious response problem, excessive coupling was found to exist in the receiving set between wires carrying r-f current from one plug-in assembly to another. Certain of these wires are being replaced by coaxial cables and the wiring harness layout on the chassis is being modified. In addition, a modification of the plug-in assembly connectors to relieve stress on the connectors during installation will result in improved reliability. These modifications cannot practically be made in the field, and the present system is to include these modifications, only in those receiving sets having serial numbers from 12 up.

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4. Planning

During the next reporting interval, the major effort will be directed toward expediting the production of systems incorporating the improvements described in this progress letter.

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